

SERVICE INSTRUCTIONS

REGENCY MA-127 STANDARD SCANNER REGENCY MA-128 OPEN CHANNEL SCANNER REGENCY MA-129 PRIORITY SCANNER

A. GENERAL DESCRIPTION

1. The MA-127 Scanner scans up to four channels, locking on channels which are in use. The scan function is disabled by removing the transceiver microphone from its holder, or optionally via a front panel switch. Channels may be omitted from the scan function by removing jumpers from the option board. A slower, two second scan rate is jumper selectable also.
2. The MA-128 Scanner scans up to four channels in two squelch modes controlled primarily by the microphone hang-up button with the microphone in its holder, the scanner searches for a channel with a carrier. With the microphone removed from its holder, the scanner searches for channels with no carrier. A channel locking function is provided on the MA-128 to freeze the scanner on a channel should either of two conditions be met. If, after stopping on an unsquelched channel, a message is received and detected by another option, the scanner will remain on that channel until it is reset. If the scanner is stopped on an unused channel, depressing the push-to-talk switch will also lock the scanner on that channel. In both cases, the channel lock is reset upon returning the microphone to its holder. For example, suppose the MA-128 is being used in conjunction with the MA-147 2805 Hz Dial Decoder in an R.C.C. system. With the mike hung-up, the scanner scans channels until it finds one which opens the transceiver's noise squelch due to the presence of a carrier. While dwelling on this channel, the 2805 Hz Dial Decoder can accept dial codes. Should the correct dial code be received, the message lamp will light and the scanner will stay on that channel. The operator may now respond to the station which called. When the conversation is concluded, the operator may return the microphone to its holder, and scanning for a carrier will resume. For an outgoing call, the operator lifts the mike and waits for the scanner to lock on an unused channel. When such a channel is found, the beginning of the operator's call locks the scanner on that channel. Again, returning the microphone to its holder resumes carrier scanning. If manual operation is desired, a switch will disable the scanner and allow channel control with the front panel selector switch. Channels may be omitted from the scan function by removing jumpers from the option board. A slower, two second scan rate is jumper selectable, also.
3. MA-129 Scanner scans up to four channels, locking on channels which are in use. When stopped on a channel, however, a priority channel is interrogated about once a second. Should a station appear on the priority channel, the scanner will stop there. Scan functions are halted when the microphone is removed from its holder, and frequency control is returned to the transceiver's channel selector knob. Additionally, a switch may also disable the scanner. Buss wire jumpers are provided which may be removed from the printed circuit board to optimize performance of the scanner. The user may set up the scanner to:
 - a. Delete any number of channels from the scan sequence.
 - b. Scan at either of two rates and,
 - c. Use either channel #1 as the priority channel or a channel determined by the channel selector knob.

4. The MA-127 Standard Scanner may function independently or in unison with several other options. Generally, the MA-127 is compatible with all Regency CTCSS options. The MA-128 was designed to be used in conjunction with the MA-147 2805 Hz Decoder and Regency Two-Tone Sequential options. The MA-129 Priority Scanner may function independently or in unison with several other options not affected by scanning operations, but care should be taken in choosing these options to avoid complications which could result in incorrect functions. When in doubt, refer to the schematics of the options and transceiver in question.

B. CIRCUIT DESCRIPTION

The main scan function is provided by IC1602, which provides open collector outputs at pins 3, 4, 5 and 6 for scanning channels 1 thru 4 respectively. One of these pins will sink current at a given time when in the scan mode. The channel sensing input (IC1602, Pin 14) must see a low on each scanned channel in order to dwell there for a time period long enough to allow squelch break. If a low is not seen, the dwell time is extremely short. Dwell time is determined by R1602 and C1603 which are the time constants for IC1602's internal clock. The squelch input (IC1602, Pin 15) holds the scanner on a given channel when it goes high.

1. MA-127 and MA-128

Lifting the mike from its hanger allows K5 to go high and the control input (IC1602, Pin 13) to go low, disabling IC1602. This also saturates Q1601 to return control to the channel selector switch. IC1601B is a buffer between the squelch input and the K9 line.

2. MA-128

IC1601B provides logic to the squelch input based upon K9 (RCVR \overline{SQ}) and K5 (MIKE-ON-HOOK). IC1601C and IC1601D are logical inverters which form a crossed-feedback latch through R1613 and R1614. Should the latch be set by a logic low D0 (MESSAGE) or C5 (PTT), a logic high will appear on the output of IC1601C (Pin 10). This in turn pulls Tim. input of IC1602 high, latching the scanner on the channel. A subsequent hang-up of the mike will lower K5 and reset the latch.

The scanner can be disabled only thru the switch SWA. Opening SWA puts a logic high on the input to inverter IC1601A forcing a low to appear on Cont. of IC1602. At the same time, Q1602 saturates, returning control to the channel selector switch thru K4.

3. MA-129

IC1603 provides functions necessary for interrogation of the priority channel. R1610 and C1606 are the timing elements for the internal oscillator of IC1603, controlling the time between interrogations of the priority channel. When lock up of IC1602 occurs the squelch input of IC1603 detects the high K9 input and turns on its oscillator. The control output of IC1603 goes from A high to a low every second or so for a period of about 80 ms. This does 3 things:

- a. IC1602 is disabled directly thru the control line.
- b. IC1601C inverts control line logic to saturate Q1602 and thus switch to the priority channel, and
- c. Q1603, IC1601D and the associated pulse stretching circuitry put a logic low on the attn. input. When the attn. input goes low, the audio amp in

(c. cont.) IC1603 is muted, killing audio to the receiver output. This eliminates an annoying pop in the receiver speaker that would exist otherwise during priority channel interrogation. Obviously, should the squelch line be high, the logic within IC1603 will hold the control output low. The priority on/off switch disables the priority function by not allowing the discharge of C1606 and the subsequent clocking of IC1603.

Should the mike hang-up button become ungrounded or the scan/monitor switch be opened, K5 will go high. This disables IC1602 thru IC1601A and saturates Q1601 to return control to the channel selector switch thru K4.

C. INSTALLATION

Read thru all installation steps before proceeding. Refer to the schematic and layout diagrams as necessary.

1. Choose scan speed. For fast scanning (80 msec/chan dwell) no modifications are necessary; proceed to step B. For slow speed scanning (.5 sec/chan dwell) snip out JU1605. Slow speed scanning must be used with subaudible tone.
2. Choose channels to be scanned. Removal of JU1601, JU1602, JU1603 or JU1604. Results in the omission of the associated channel (1 thru 4 respectively) from the scan sequence.

a. MA-129

Choose priority channel mode. If it is desired that the priority channel be channel #1, no modifications are necessary and you may proceed to step D. However, great flexibility in priority scanning may be attained if the operator can choose his priority channel. Rewiring JU1606 to the position shown on the schematic (collectors of Q1601 and Q1602 tied together) allows the operator to set the priority channel with the channel selector switch.

3. Mount the option board in one of the option areas provided in the transceiver using the self-tapping screws provided.
4. Remove the K4 to G jumper from the transceiver.
5. Connect the jumpers from the option board to the corresponding points on the transceiver board as indicated on the proper schematic.
6. Connect the jumpers between points located on the transceiver board as indicated on the proper schematic.
7. Be sure to remove the jumpers indicated on the schematic or the option will not function properly.

a. MA-128 Used With Decoders

Connect J01624 to the board of the call detecting option. The 2805 Hz Decoder is shown on the schematic as an example.

D. ADJUSTMENT PROCEDURE

No specific adjustments are required on the Scanner P.C. Board itself, But the following operating characteristics should be observed.

1. MA-127, MA-128 and MA-129

Turn the radio on with the microphone hang-up button grounded, the scan switch closed and the radio tightly squelched. The receiver should now be scanning as indicated by the channel L.E.D.'s. Turn the squelch knob to the unsquelched position. This should stop the scanning. Rotate the squelch knob in the opposite direction to a position slightly beyond the point at which the scanning resumes.

2. MA-128

- a. Insert an R.F. carrier on one of the scanned receive frequencies into the antenna connector at a level sufficient to halt the scanner on that channel. Now modulate the carrier in such a way as to activate the decoder option. Once the message lamp is lit, remove the carrier. Scanning should not take place. The receiver should remain on channel even with the mike hang-up button ungrounded. Regrounding the mike hang-up button results in resumed scanning.
- b. Remove the signal generator from the R.F. input and replace it with a dummy load. Open the squelch fully, so that scanning halts. Unground the mike hang-up button. Scanning should resume. Rotating the squelch knob back into squelched position should result in a halt in scanning. Key the transmitter with the PTT button. Now, rotating the squelch control back and forth through the squelched-to-unsquelched region, observe that scanning does not resume. Squelch the radio and ground the mike hang-up button and the scan function should return.

3. MA-129

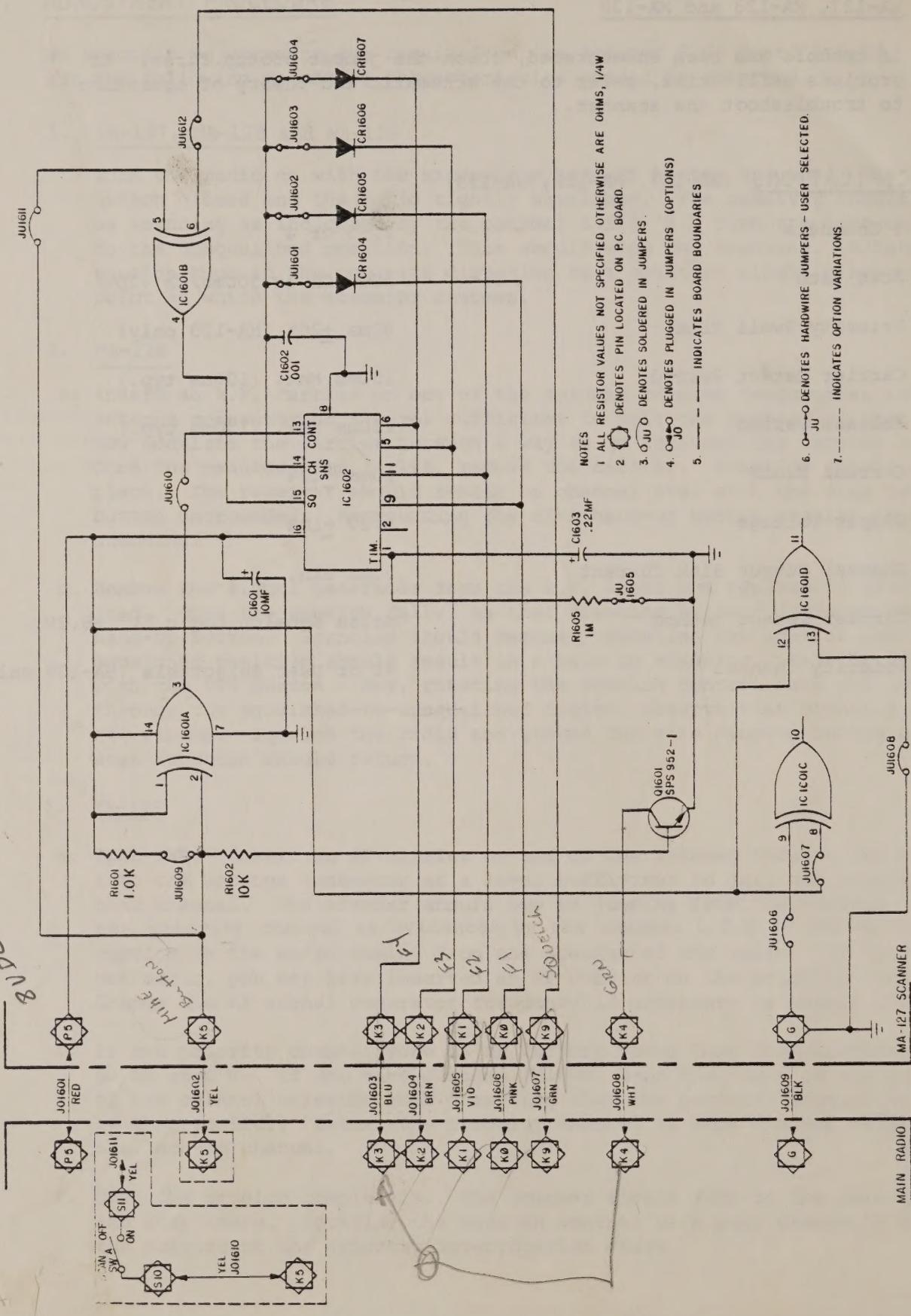
- a. Open SWB. Insert an RF carrier on one of the scanned receive frequencies into the antenna connector at a level sufficient to halt the scanner on that channel. The scanner should now be jumping from the lock-up channel to the priority channel as evidenced by the channel L.E.D.'s and an interruption in the audio coming from the speaker of the radio. If this does not occur, you may have inserted an RF carrier on the priority channel. Change the RF signal generator frequency if necessary to obtain this state.
- b. If the priority channel mode is as factory wired (see installation, step 2 a.), go to step c. If you have changed JU1606, step thru each of the positions of the channel selector knob observing that the priority channel is determined by this control. Return the priority channel to some channel other than the lock-up channel.
- c. Open the squelch completely. The scanner should jump to the priority channel and stay there. Rotating the squelch control back past threshold should return the scanner to the priority interrogation state.

4. MA-127, MA-128 and MA-129

If trouble has been encountered, check the jumper hookup first. If problems still exist, refer to the schematic and theory of operation to troubleshoot the scanner.

E. SPECIFICATIONS (MA-127, MA-128, MA-129)

# Channels	2, 3 or 4
Scan Rate	80ms/Ch or 500ms/Ch <u>+20%</u>
Priority Dwell Time	80ms <u>+20%</u> (MA-129 only)
Carrier Detect Period	150ms Max. (100ms typ.)
Release Period	250ms Max. (150ms typ.)
Current Drain	10ma <u>+10%</u>
Supply Voltage	8.2V <u>+10%</u>
Channel Output Sink Current	50ma Min.
Carrier Detect Method	Noise Squelch Logic "1" +8.2V
Priority Channel	#1 or User Selectable (MA-129 only)



NOTES
1 ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, 1/4W

2. DENOTES PIN LOCATED ON PC BOARD.

3. σ_{JU} σ DENOTES SOLDERED IN JUMPERS.

4.  DENOTES PLUGGED IN JUMPERS  OPTIONS                     

5. — — — INDICATES BOARD BOUNDARIES

7. INDICATES OPTION VARIATIONS

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CHAP.
CHAP.

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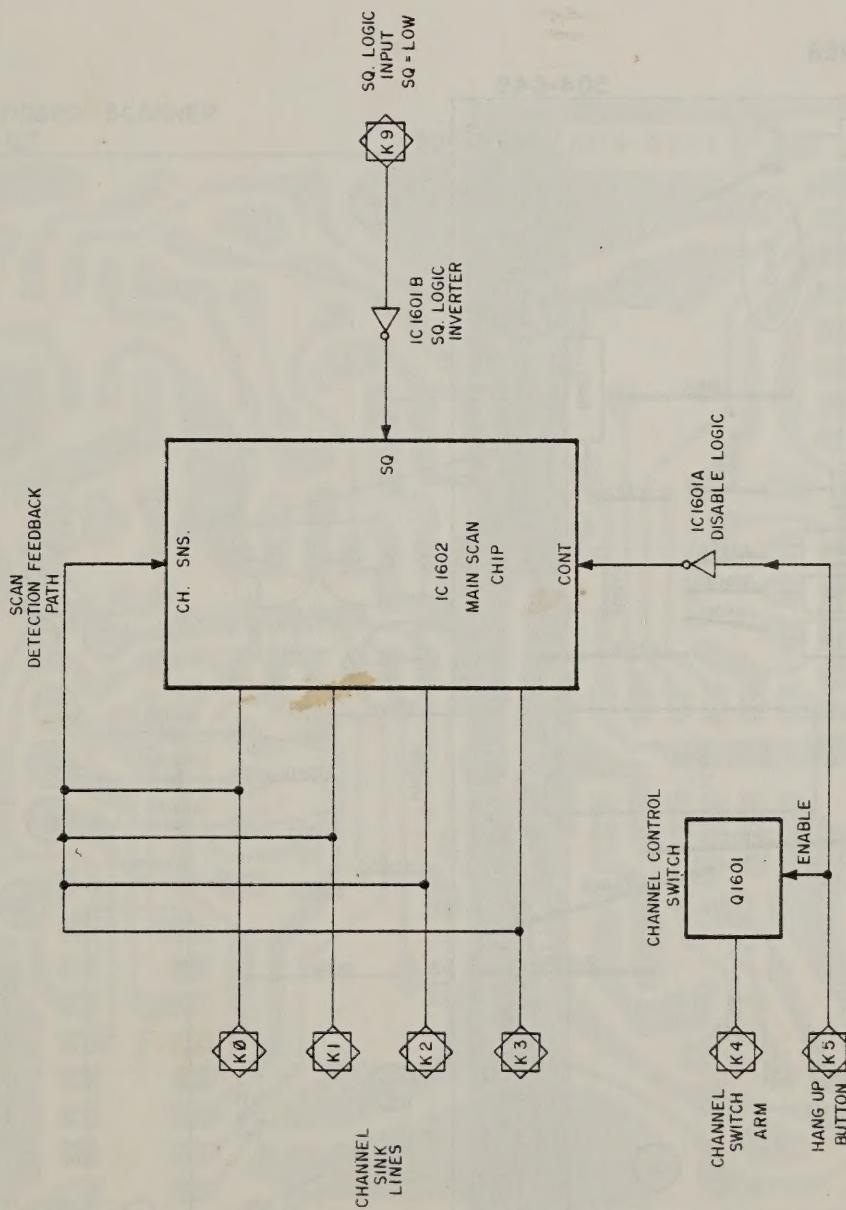
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1994

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REVISIONS		DESCRIPTION		DATE	APPROVED
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COMMUNICATIONS INC.
Frequency, SATELLITE BEACH, FLORIDA 32937

BLOCK DIAGRAM
STANDARD SCANNER

SIZE C PART NUMBER 504-192

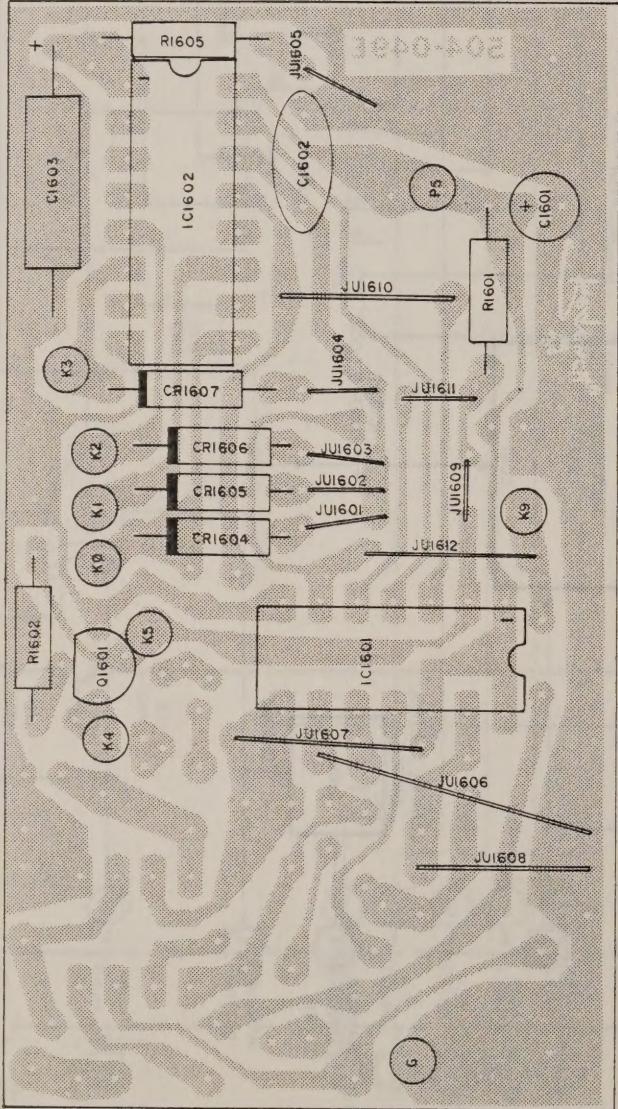
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REV. A

SHEET 1 OF 1

STANDARD SCANNER
MA-127

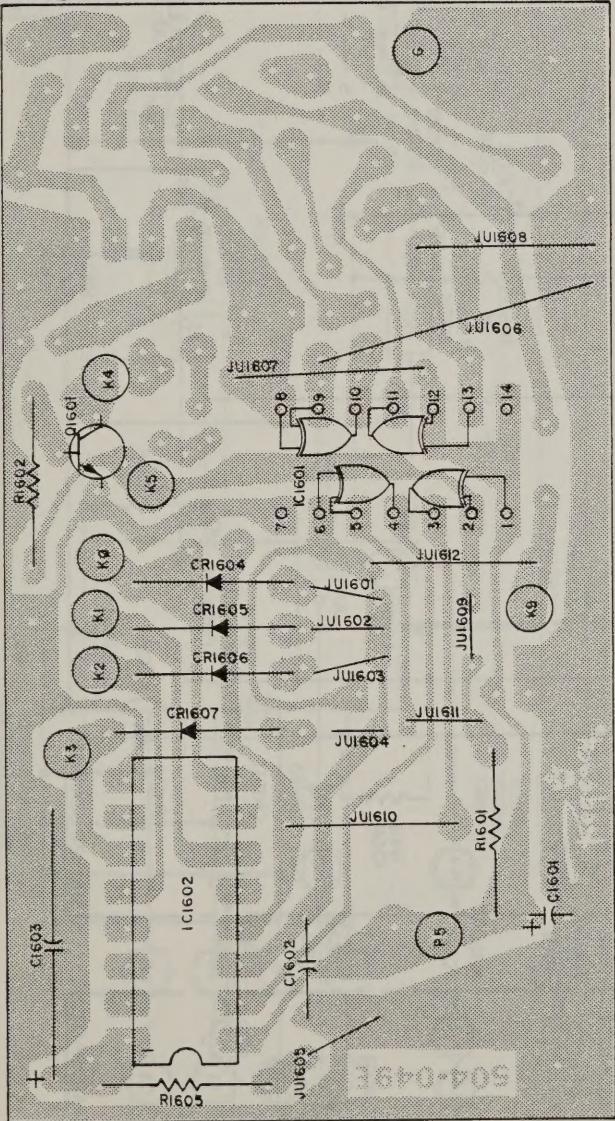
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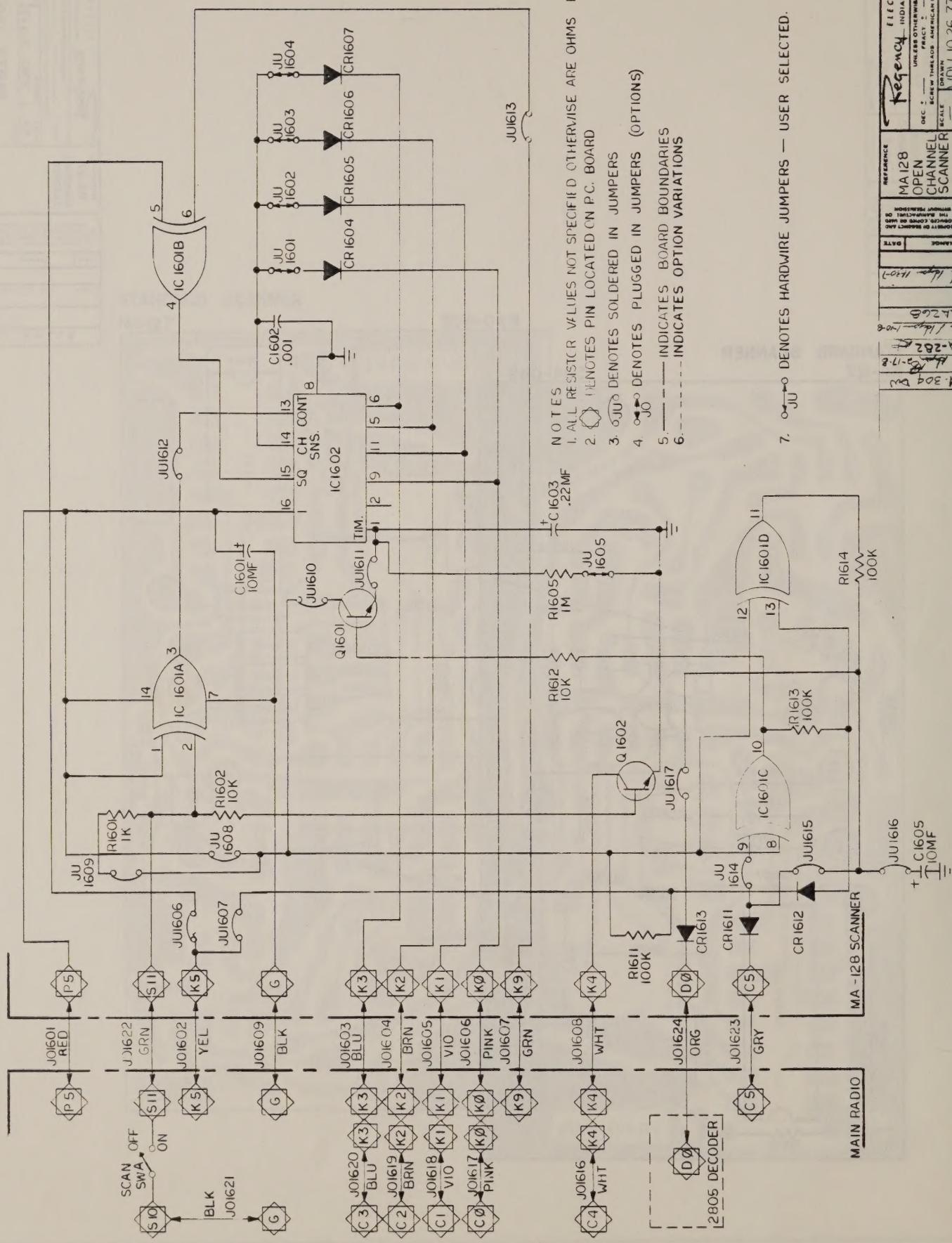


 Regency ELECTRONICS INC. INDIANAPOLIS, INDIANA 46226		REV A	
Dwg. 7 - <u>SCHEMATIC</u> DRAWINGS TRANSLATED TO AMERICAN NATIONAL C.G.S.		PARTS PLACEMENT DRAWING NO. 504-066	
REFERENCE MA-127 STANDARD SCANNER	SCALE 4:1 W.W.T. 12-9-77 ENG CO DRAWIN FILE		DRAWING NO.
	DATE CHARGE DATE		
NOTWITHSTANDING THE INFORMATION CONTAINED HEREIN, THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF REGENCY ELECTRONICS INC. AND IS PROPRIETARY INFORMATION. IT MAY NOT BE USED, REPRODUCED, OR DISCLOSED, IN WHOLE OR IN PART, WITHOUT THE WRITTEN CONSENT OF REGENCY ELECTRONICS INC.			

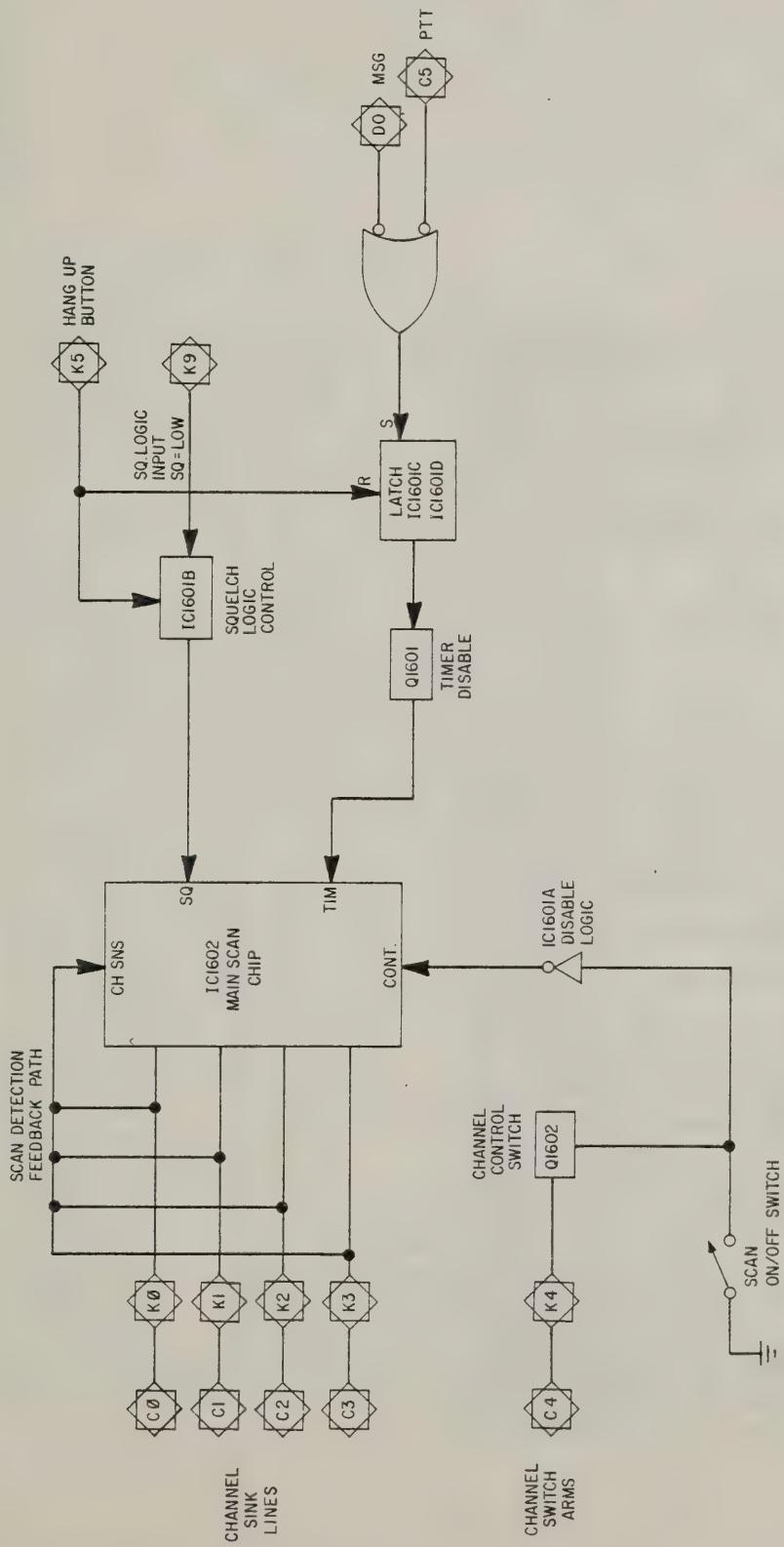
STANDARD SCANNER
MA-127

504-049





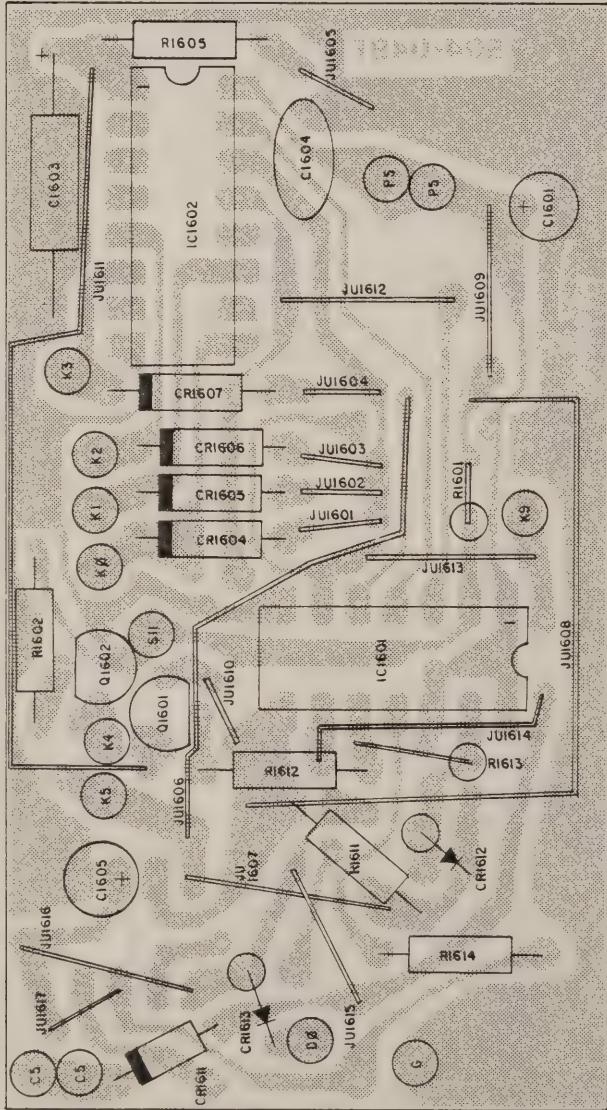
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MA-128		FINISH ~ ~		
NEXT ASSY		USED ON APPLICATION		DO NOT SCALE DRAWING

OPEN CHANNEL SCANNER
MA-128

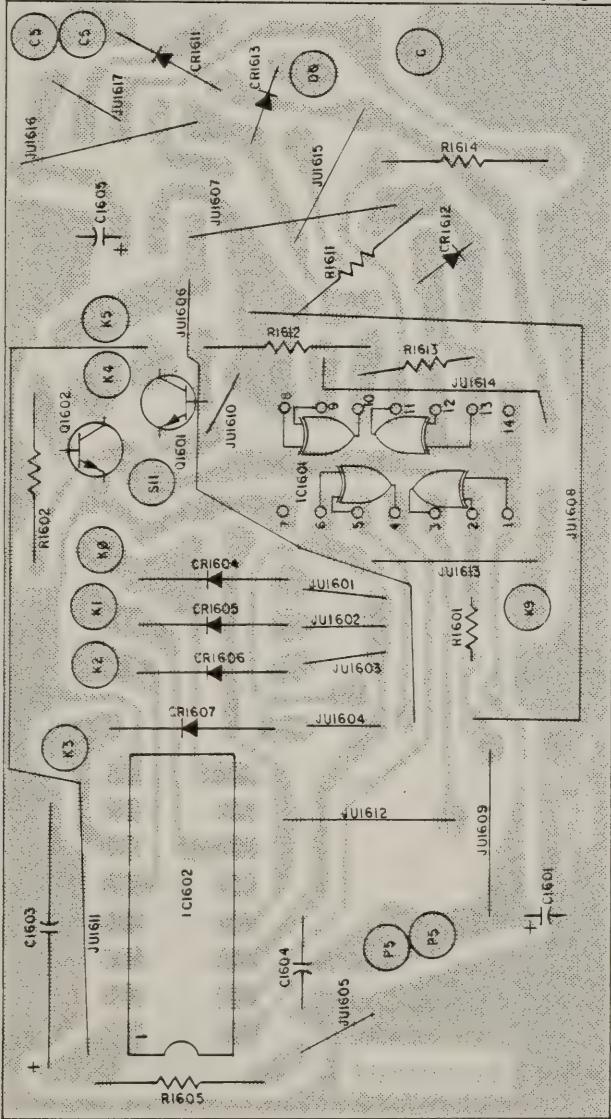
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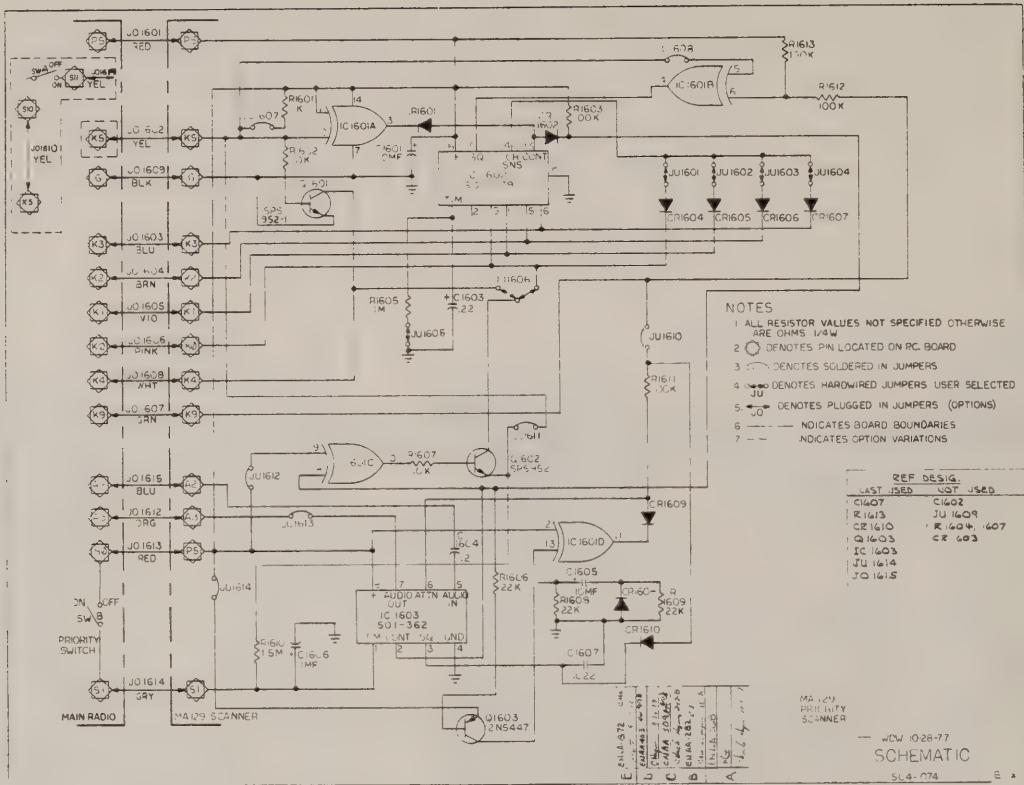


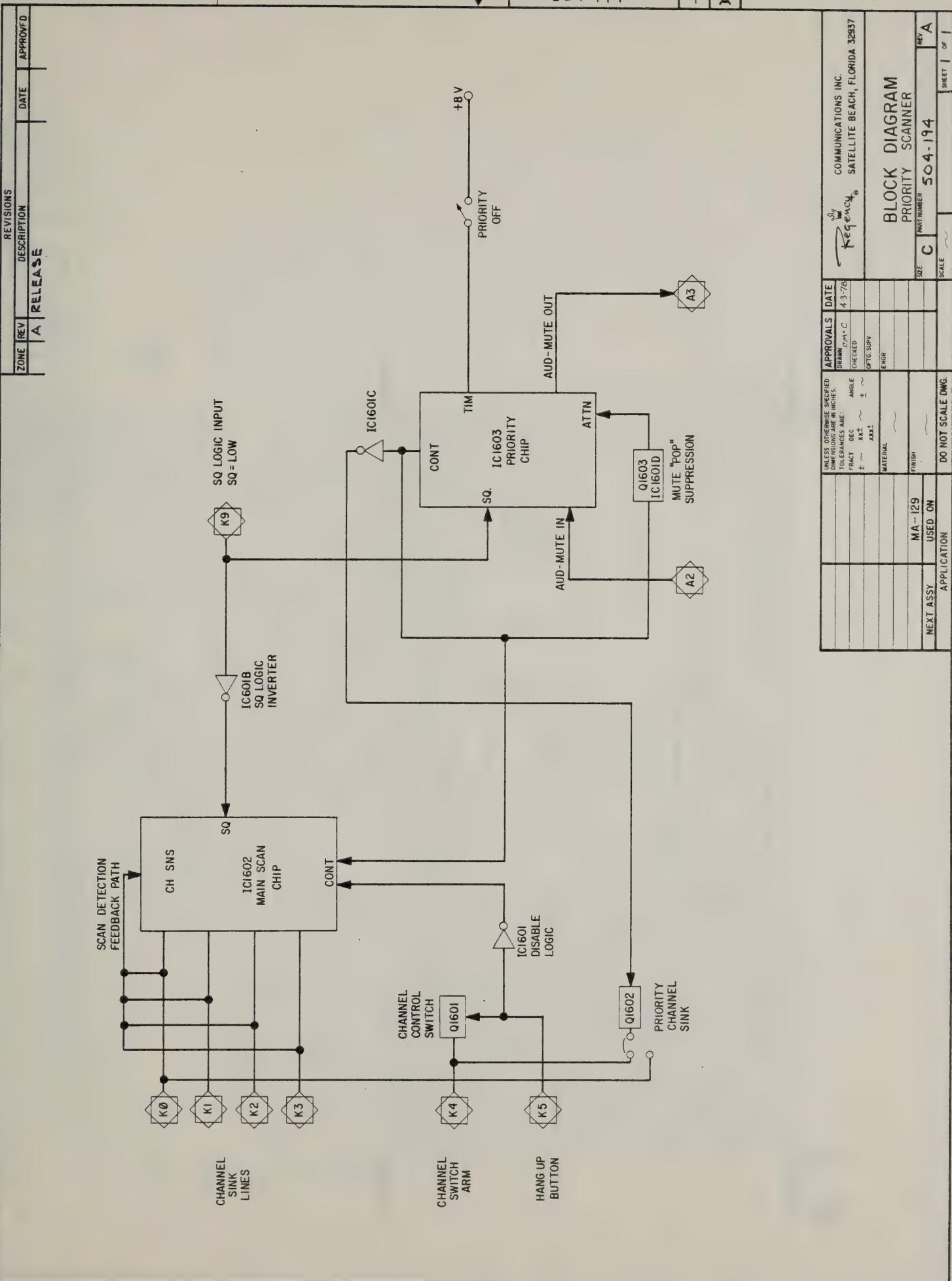
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SCANNER		THE PRODUCT OF THE UNITED STATES	
REGENCY ELECTRONICS INC.			
INDIANAPOLIS, INDIANA 46226			
UNLESS OTHERWISE SPECIFIED			
DEC. 2, 1964		FRACT. 2 ANGLES 2	
S. NEW THREADS		AMERICAN NATIONAL, L-1252	
SCEAL		CNC-1000	
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TITLE		PARTS PLACEMENT	
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OPEN CHANNEL SCANNER
MA-128

504-049

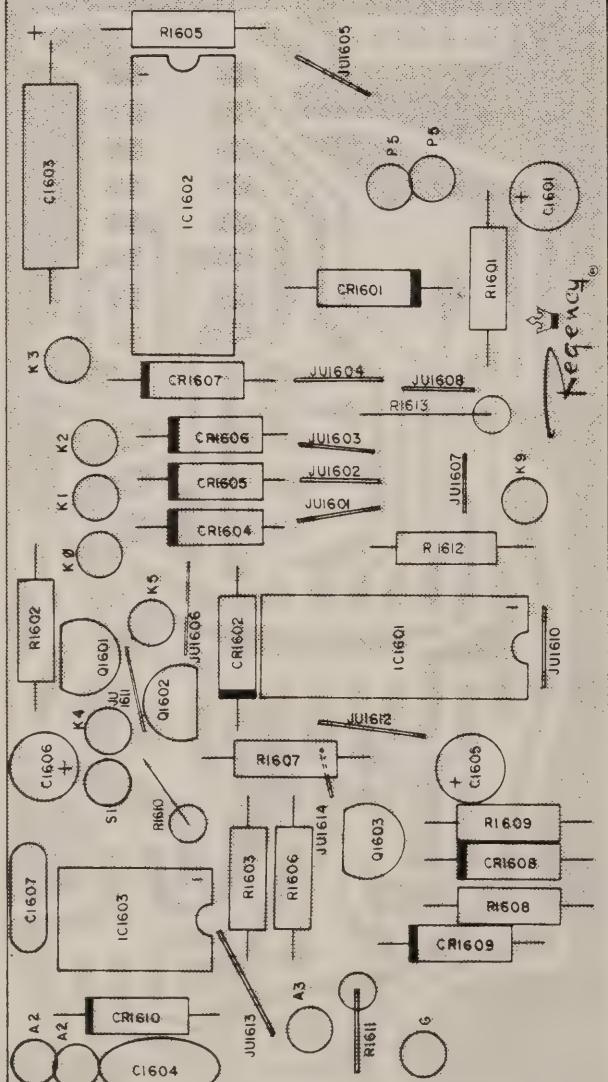






PRIORITY SCANNER
MA-129

504-049



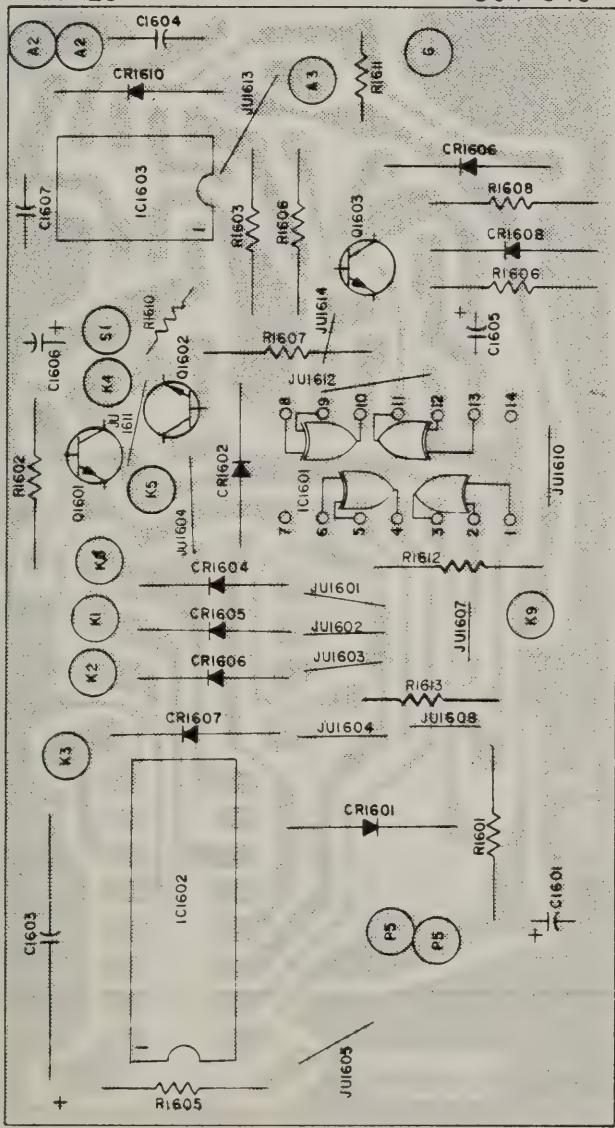
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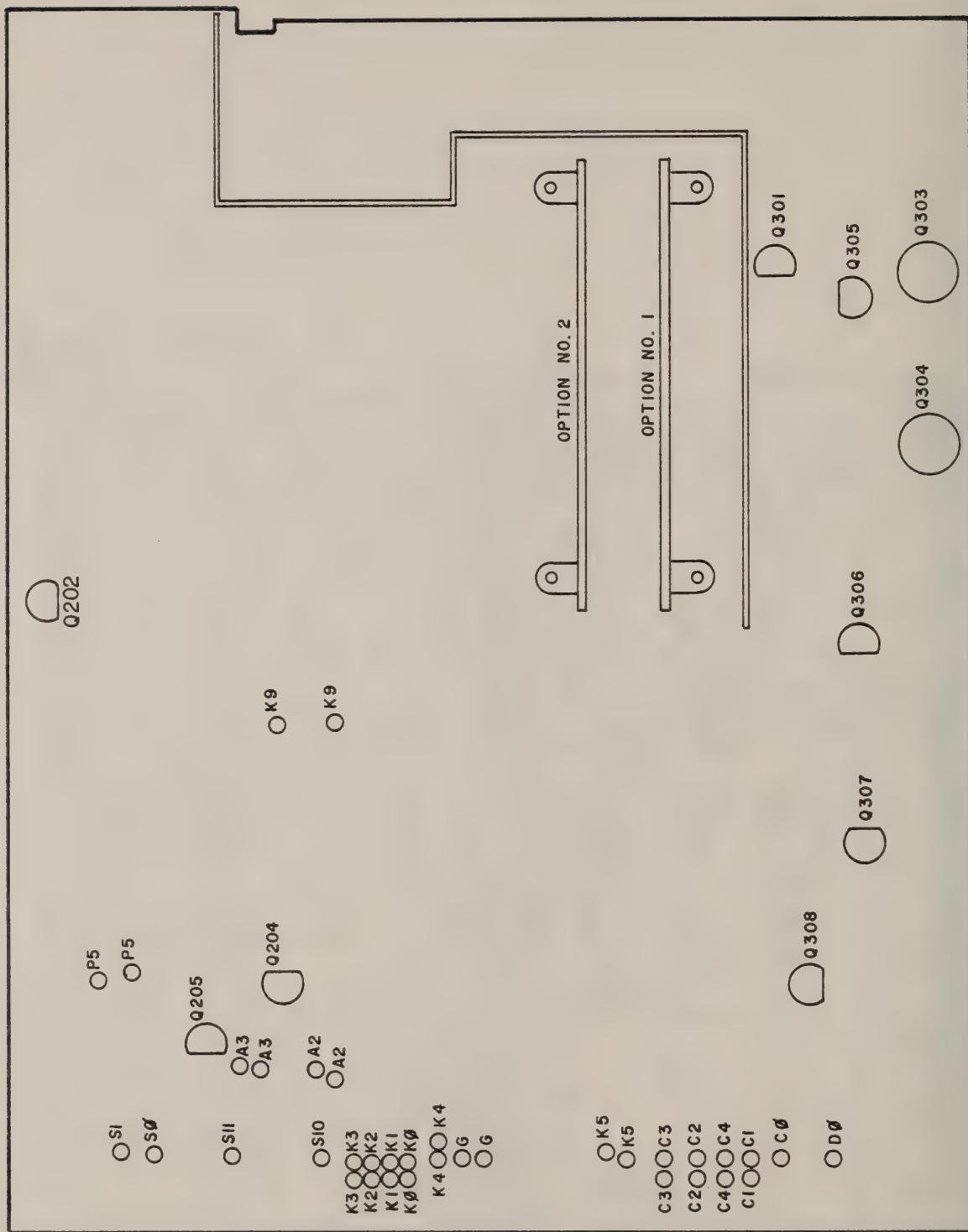
2. THIS ARTWORK IS A POSITIVE.
3. SILKSCREEN COMPONENT DESIGNATION (LEGEND) ON THE COMPONENT SIDE OF THE PC BOARD WITH STANDARD WHITE NO 6512 ETHYL CELLULOSE POSTER INK AS SUPPLIED BY THE NAZ-DAR CO., CHICAGO, ILL. OR ENG. APPROVED EQUIVALENT.

REFERENCE	CHANNEL	DATA
MA 127	127	Regency Electronics Inc
128	128	UNIVERSITY COMPUTER SYSTEMS INC
129	129	SCREEN MASTERS INC
PRIORITY	DATA	SCANNERS
SCANNER	41	WML 12.977

PRIORITY SCANNER
MA-129

504-049





RADIO INTERFACE DIAGRAM

PARTS LIST

MA-127, MA-128, MA-129

CAPACITORS

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>PART #</u>	<u>USAGE</u>
C1601	10mf 16V(ELECT)	1513-0100-002	MA-127,MA-128,MA-129
C1602	.001mf +8-2 50V(CD)	1503-0102-003	MA-127,MA-128,MA-129
C1603	.22mf 10% 35V(TANT)	1515-0228-009	MA-127,MA-128,MA-129
C1604	.2mf 12V(CD)	1502-0204-006	MA-129
C1605	10mf 16V(ELECT)	1513-0100-002	MA-128
C1605	10mf 25V(TANT)	1515-0100-005	MA-129
C1606	1mf 16V(ELECT)	1513-0010-002	MA-129
C1607	.022mf 10% 100V(MYLAR)	1508-0223-610	MA-129

RESISTORS

(All Resistors are +10%, $\frac{1}{4}$ W, unless otherwise noted.)

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>PART #</u>	<u>USAGE</u>
R1601	1.5K	4701-0152-042	MA-127
R1601	1K	4701-0102-042	MA-128,MA-129
R1602	18K	4701-0183-042	MA-127
R1602	10K	4701-0103-042	MA-128,MA-129
R1603	100K	4701-0104-042	MA-129
R1604	NOT USED		
R1605	1M	4701-0105-042	MA-127,MA-128,MA-129
R1606	22K	4701-0223-042	MA-129
R1607	10K	4701-0103-042	MA-129
R1608	22K	4701-0223-042	MA-129
R1609	22K	4701-0223-042	MA-129
R1610	1.5M	4701-0155-042	MA-129
R1611	100K	4701-0104-042	MA-128,MA-129
R1612	10K	4701-0103-042	MA-128
R1613	100K	4701-0104-042	MA-128
R1614	100K	4701-0104-042	MA-128

INTEGRATED CIRCUITS

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>PART #</u>	<u>USAGE</u>
IC1601	Excl Or	3130-3157-639	MA-127,MA-128,MA-129
IC1602	Scan Sub-Sys	3130-5127-900	MA-127-MA-128,MA-129
IC1603	Scan Cont	3130-5136-200	MA-129

TRANSISTORS

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>PART #</u>	<u>USAGE</u>
Q1601	Sil NPN	4801-0000-010	MA-127,MA-128,MA-129
Q1602	Sil NPN	4801-0000-010	MA-127,MA-128,MA-129
Q1603	Sil PNP	4801-0000-135	MA-129

DIODES

<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>PART #</u>	<u>USAGE</u>
CR1601	Sil	4805-1241-200	MA-129
CR1602	Sil	4805-1241-200	MA-129
CR1603	NOT USED		
CR1604	Sil	4805-1241-200	MA-127,MA-128,MA-129
CR1605	Sil	4805-1241-200	MA-127,MA-128,MA-129
CR1606	Sil	4805-1241-200	MA-127,MA-128,MA-129
CR1607	Sil	4805-1241-200	MA-127,MA-128,MA-129
CR1608	Sil	4805-1241-200	MA-129
CR1609	Sil	4805-1241-200	MA-129
CR1610	Sil	4805-1241-200	MA-129
CR1611	Sil	4805-1241-200	MA-128
CR1612	Sil	4805-1241-200	MA-128
CR1613	Sil	4805-1241-200	MA-128

2700 x 52

INTEGRATED CIRCUITS

LOCATION	DESCRIPTION	PART #
10100	IC1000	
10101	IC1001	
10102	IC1002	

TRANSISTORS

LOCATION	DESCRIPTION	PART #
21000	2N3055	4001-0000-000
21001	2N3055	4001-0000-010
21002	2N3055	4001-0000-020

DIODES

LOCATION	DESCRIPTION	PART #
30100	1N4001	4002-1241-200
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30102	1N4001	4002-1241-200
30103	1N4001	4002-1241-200
30104	1N4001	4002-1241-200
30105	1N4001	4002-1241-200
30106	1N4001	4002-1241-200
30107	1N4001	4002-1241-200
30108	1N4001	4002-1241-200
30109	1N4001	4002-1241-200
30110	1N4001	4002-1241-200
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